8.11

Squire and Partners

Twyman House, London NW1

Arboriculture Report

By David Partridge Associates

For CIT Developments Ltd

10003

April 2011

Report for

CIT Developments Ltd
7 Curzon Street
London W1J 5HG

Main Contributors

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Approved by

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Arboricultural Report to Support Planning Application at:

Twyman House
Camden Road
London

April 2011

Ecology

Ecological factors not present at the time of our or any third party ecological inspections, but found prior to and/or during works can necessitate changes in the project methods, proposed works schedules, timescales and budgets in, order to ensure compliancy with UK law.

Contents

Appendices

1.0 The Site

1.1 The site is situated on the Camden Road in London. There is an existing office block on the site with associated access roads and hard surfaces. There are numerous existing deep retaining wall structures running across the site in various locations. Where these retaining wall structures are situated directly adjacent to trees (which are to be retained) they are being left in situ to safeguard the trees during both the proposed demolition and construction works at the site.

1.2 There are a number of trees of varying species, size, age and visual significance both on and adjacent to the site.

2. 0 Development Proposals

2.1 The drawings submitted to the Local Planning Authority show the proposal as:

- Demolition of the existing office building at the site and erection of a number of residential blocks of varying heights and conversion of an existing property with associated new hard and soft landscaping

2.2 All trees to be retained will be protected in accordance with BS5837:2005 during both the demolition and construction phases of the proposed development. The proposed new staircase / pedestrian access to the Regents Canal from Camden Road will require the removal of a single London Plane tree (detailed as T2 within this report). The removal/ replacement of this tree to facilitate this new public access to the canal has been agreed in principal with the owner of this tree (British Waterways). This tree is situated down on the Canal Towpath and is growing under/within the crown of an adjacent larger London Plane tree (detailed as T1 within this report) which is to be retained. T2 is therefore not considered to be significant within the local and/or wider landscape.

2.3 New and replacement trees, shrubs and hedges will be planted to make the scheme more visually desirable for both the residents of the proposed scheme and wider community. The proposed landscape planting also aims to provide public amenity space and enhance the ecological value of the site and improve biodiversity. The details of this landscaping scheme have been be submitted under separate cover to support the application.

3.0 Policy Context, Planning History and Current Stage in the Design Process

3.1 This report seeks to cover the requirements of the London Borough of Camden's policies and planning guidance and accompanies the application for development of the site.

3.2 We can confirm that this application for development, after consultation with a qualified Arboriculturalist, has been specifically altered/designed in order to ensure that all significant trees at and adjacent to the site can be retained and protected both during and post development of the site in accordance with the relevant British Standard (BS 5837:2005) and accepted best practice.

4.0 Tree Preservation Orders / Conservation Areas

4.1 We understand that none of the trees present at the site are subject to a Tree Preservation Order (TPO). The site is situated within the Regents Canal Conservation Area.

5.0 Arboricultural Supervision and Site Inspections

5.1 The applicant and site owner have confirmed that they will be appointing a suitably qualified and experienced Arboricultural Consultant to supervise and document the installation of all the tree protective measures and special precautions (BS5837:2005) noted within this report.

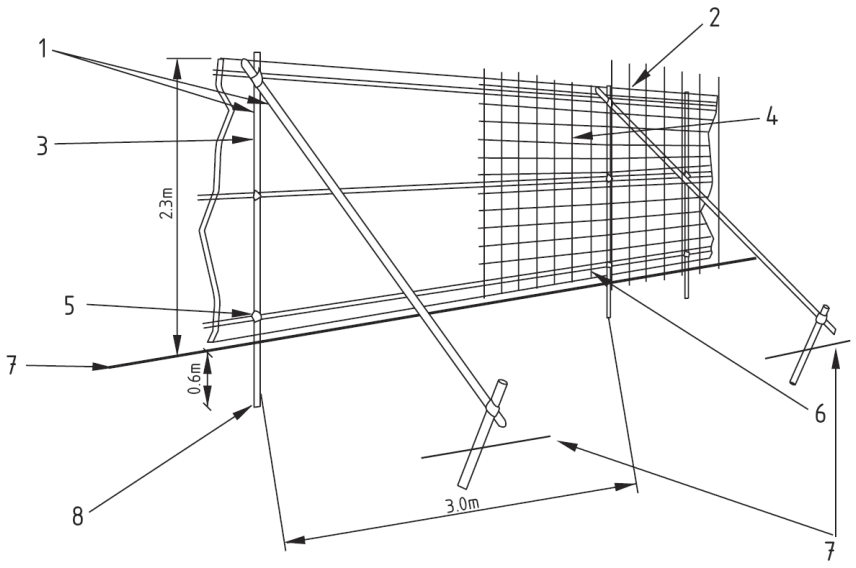
6.0 Tree Constraints – Overview

6.1 Data on all significant trees at and adjacent to the site has been collected and is detailed on Drawing Number DPA-69635-01 entitled Proposed Layout (Tree Constraints) and within the tree data tables within the appendices of this report.

6.2 All trees shown as retained within the tree tables and/or drawings that accompany this report, will be protected in accordance with British Standard BS:5837 2005 - Trees in Relation to Construction, prior to the commencement of any development activity at the site. The proposed location of the tree protective fencing is shown on Drawing Number DPA-69635-01 within the appendices of this report.

6.3 The tree protective fencing at the site will be in accordance with Figure 2 – Protective Barrier at page 13 of BS 5837:2005 (as shown below) or similar to be agreed with the Local Planning Authority (Tree Officer).

Figure 1 - Extract from BS5837:2005



1 Standard scaffold poles
2 Uprights to be driven into the ground
3 Panels secured to uprights with wire ties and where necessary standard scaffold clamps
4 Weldmesh wired to the uprights and horizontals
5 Standard clamps
6 Wire twisted and secured on inside face of fencing to avoid easy dismantling
7 Ground level
8 Approx. 0.6 m driven into the ground

Figure 2 — Protective barrier

6.4 The root protection areas shown on Drawing Number DPA-69635-01 will be considered as sacrosanct during the development of the site. Any changes in existing soil levels will be forbidden without prior consultation with the retained Arboricultural Consultant. Any changes to the agreed tree protective measures at the site will require the prior written permission of the Local Planning Authority (Tree Officer).

7.0 Tree Constraints – Site Access & Demolition

7.1 Access to the site for demolition & construction is to be carried out via the a new site access point on Bonny Street. The details regarding site access are contained within the construction management plan which accompanies the application.

7.2 The existing deep retaining wall structures at the site (shown on Drawing Number DPA-69635-01) will be retained in situ during both the demolition and construction phases of the proposed development to safeguard London Plane T1.

7.3 Precautions will also be taken during the demolition of the existing building to ensure the crown of London Plane T1 is not damaged (including minor tree works and scaffold and/or hoarding which will be detailed within the Demolition Method Statement for the site).

7.4 It is proposed to leave the existing access roads and hard surfaces in situ at the site during the demolition phase of the proposed development. Therefore providing the tree protective measures noted at Section 6.0 of this report are installed prior to the commencement of demolition works, and measures are taken to protect the crown and roots of T1, no other special precautions or measures will be required during this phase of the development.

8.0 Tree Constraints – Proposed Access Road / Replacement Hard Surfaces

8.1 The majority of the site is currently either occupied by buildings and/or existing hard surfaces. It is proposed to install a replacement access road and hard surfaces at the site. These elements of the proposed development have been reviewed by a qualified Arboriculturalist and amended to limit the potential for any damage to the trees which are to be retained both at and adjacent to the site.

8.2 Following the completion of demolition and construction activity at the site it is proposed to remove and replace the existing hard surfaced access road. The majority of the proposed access road is situated outside of the required root protection areas (BS5837:2005) for the trees which are to be retained at and adjacent to the site. However, to ensure the proposed development is in accordance with the requirements of BS5837:2005 it is proposed to replace it with a permeable ‘no dig’ access road (where it falls within the root protection areas for the any of the retained trees).

8.3 The existing hard surfacing on the frontage of the site adjacent London Plane T1 is to be retained in situ during both the demolition and construction phases of the proposed development to safeguard T1. This existing hard surface will then be removed and replaced with a new permeable hard surface under the close supervision of the retained Arboricultural Consultant to ensure compliance with BS5837:2005 and accepted best practice.

8.4 The location of the proposed new hard surfaces are detailed on Drawing Number DPA-69635-01 at Appendix 2 of this report and within the Landscape Proposals submitted to support the application.

8.0 Tree Constraints – Proposed Access Road / Replacement Hard Surfaces (continued)

8.5 As previously noted the construction of the new hard surfaces will require works within the required root protection areas for trees detailed within this report. Therefore special measures and/or methods will be required to ensure that these trees are protected in accordance with BS5837:2005 and accepted best practice.

8.6 In summary the replacement permeable 'no dig' hard surfaces will be constructed as follows:

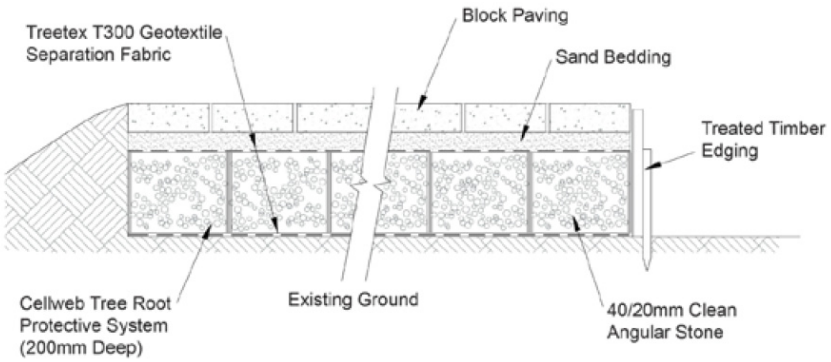
1) Existing hard surfaces/access road removed by hand (i.e. either by hand or utilising mechanised equipment under the close supervision of the Arboricultural Consultant).

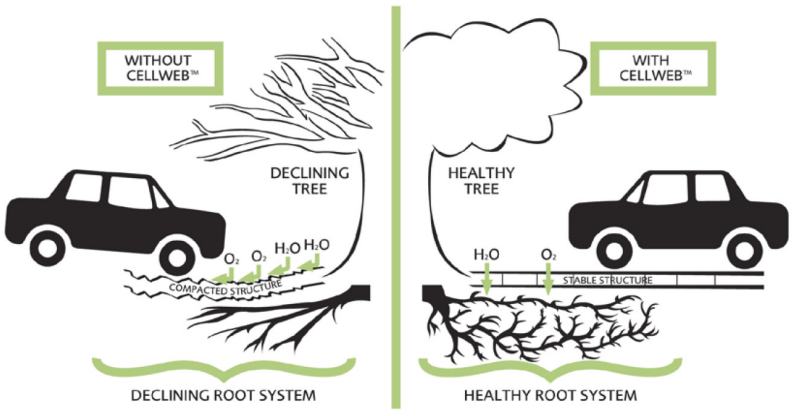
2) No more than 100mm of top soil (BS3882) used to level the areas and a permeable nonwoven polypropylene geotextile farbric (such as Treetex T300, Fibretex F22 or similar) fixed over the areas in question.

3) CellWeb TRP or similar cellular confinement system (see Figure 4 below) laid over the geotextile fabric / areas in question (see Appendix 3). No fines aggregate (4 to 40mm particle size) used to infill the cellular confinement system and a second layer of geotextile fabric laid over the above.

4) Finished permeable hard surface (small brick / tegula paviors/permeable tarmac or similar) laid by hand on the recommended sand/granular material on the cellular system / geotextile fabric (in accordance with BS5837:2005 & APN12).

Figure 1 - Examples of a CellWeb System





9.0 Tree Constraints - Construction

9.1 The majority of the proposed development falls outside of the required root protection areas for the trees which are to be retained both at and adjacent to the site. Therefore providing the tree protective measures noted at Section 6.0 of this report are installed prior to the commencement of construction works, and measures are taken to protect the crown and roots of T1, no other special precautions or measures will be required during this phase of the development.

9.2 It should be noted that whilst the footprint of the proposed new structure is situated within the required root protection area for London Plane T1, as previously noted, there are significant/deep existing retaining wall structures directly adjacent to this tree. These underground structures will have acted as root barriers and restricted/re-directed the roots of this tree. This being the case the root protection area (BS5837:2005) for T1 has been amended to reflect the specific site conditions. The existing underground structures/ retaining walls will be retained as part of the proposed development, used a formwork and the new retaining wall formed behind them to safeguard London Plane T1.

9.3 The appointed Arboricultural Consultant will, as previously noted, supervise the installation of all the tree protection measures to ensure they are to the required standards and are located at the positions detailed on the drawings that accompany this report, prior to the commencement of any development activity. Any works to facilitate the installation of tree protective measures will be carried out by hand and/or be supervised by a qualified Arboriculturalist. The Local Planning Authority (Tree Officer) should be advised when the protective fencing has been installed and when development works commence on site.

10.0 Juxtaposition of Proposed Dwellings to Trees & Light & Shade Issues

10.1 Trees will not require any detrimental ongoing management due to their proximity to structures. Trees do not dominate private amenity space and should not significantly obstruct sunlight to any habitable rooms.

10.2 In particular London Plane T1 has previously been regularly crown reduced and/or reduced back from the existing building and therefore the proposed development will not have a detrimental impact on this tree.

11.0 Proposed Tree Planting

11.1 The client has confirmed that in order to ensure continued tree cover and enhancement of the landscape, new trees, shrubs and hedges will be planted, with an appropriate aftercare contract to ensure successful establishment. An indication of the location of both new and replacement trees is shown on the Grontmij Landscape Proposals (Ref: 105984R03A) which has been submitted under separate cover to support the application.

11.2 The exact location, number, size and species of trees to be planted will be confirmed with the Local Planning Authority (Tree Officer) during the discharge of any conditions attached to any consent for the proposed development.

12.0 Underground Services

12.1 The placement and implementation of services has been considered to ensure that none of the trees identified for retention and protection will be detrimentally affected by the construction of service trenches.

12.2 It is proposed to install services in accordance with the NJUG 4 guidelines i.e. wherever possible route the services outside of the root protection areas and/or hand dig service trenches, under the supervision of a qualified Arboriculturalist within root protection areas.

13.0 Scope of Brief

13.1 Carry out a survey of the trees within and adjacent to the site in accordance with BS5837:2005 and collect data in order to advise the development team of the key issues relating to trees, with options and risk strategies.

13.2 Prepare a report, with associated tabulated data and site plans, in order to facilitate consideration of the tree issues by the Local Planning Authority.

13.3 Provide advice as to whether tree issues are likely to be a significant consideration in obtaining a planning consent, identify key areas of the development where problems may occur and where special measures or method statements that may be required during the implementation of the proposed development.

14.0 Terms of Reference

14.1 Squire & Partners Drawings (including): P_LG_G200_002 & P_00_G200_002

15.0 Conclusions

15.1 *It is concluded that:*

- Trees should not present a planning constraint to the development of this site.
- It is considered possible to retain and protect trees identified as being significant within the landscape at and adjacent to the site providing the recommendations and methods noted within this report are adhered to.

16.0 Recommendations

16.1 *It is recommended that:*

- The recommendations for tree retention and protection within this report are adhered to.
- That the Local Planning Authority (Tree Officer) considers approval of the application.

APPENDIX 1

Tree Data Tables

T. No	Species	Ht (m)	Crown Spread (m)	Stem DBH (mm)	RPA/Radius/ Max offset	Condition	Age Class	Structural Condition & Comments	Preliminary Management Recommendations	Est. (yrs)	Cat Grade
					268.22	G	M			>20	A
					9.24	F					B
					1.85	P		T1 has been previously crown reduced, reduced back from the building & crown			C
T1	London Plane	21	7.5	770		D		lifted over the highway	Retain and protect in accordance with BS5837:2005		R
					160.16	G	MA			>10	A
					7.14	F		The crown of T2 is growing within/under the crown of T1 & is situated down on			B
					1.43	P		the canal footpath. T2 is therefore is not prominent within the local landscape.	Remove & replace to facilitate new staircase / access to canal from Camden		C
T2	London Plane	15	5.5	595		D		T2 is situated very close to the main canal retaining wall structure	Road (requested & agreed with British Waterways)		R
					39.37	G	MA			>10	A
					3.54	F					B
					0.71	P		T3 is a self-seeded tree which is situated within the rear garden of a			C
T3	Ash	12	5	295		D		neighbouring property	Retain and protect in accordance with BS5837:2005		R
					38.05	G	MA			>10	A
					3.48	F					B
					0.70	P		T4 is a self-seeded tree which is situated within the rear garden of a			C
T4	Sycamore	12	5	290		D		neighbouring property	Retain and protect in accordance with BS5837:2005		R
					21.90	G	MA	T4 is a self-seeded tree which is		>10	A
					2.64	F		situated within the rear garden of a			B
					0.53	P		neighbouring property. There is a significant retaining wall directly			C
T5	Alder	11	4.5	220		D		adjacent T5	Retain and protect in accordance with BS5837:2005		R

1.0 Tree Number (T No.)

- T = Individual tree detailed on the drawings which accompany the tree report
- G = Group of trees detailed on the drawings which accompany the tree report
- W = Woodland areas detailed on the drawings which accompany the tree report
- S = Individual shrub detailed on the drawings which accompany the tree report

2.0 Species

- Tree or vegetation detailed within the tree data table using common name (UK)

3.0 Tree Height (Ht)

- Tree or other vegetation height measured from ground level and detailed within the data table in metres

4.0 Crown Spread (Cs)

- Tree crown spread radius from the main stem, detailed within the tree data tables in metres. Where tree crown spreads are not shown to scale on the drawings which accompany the tree report, measurements will be recorded and detailed within the tree data tables for North, East, South and West directions

5.0 Crown Height (Ch)

- Distance to from ground level to the lowest main branches of a tree or other vegetation detailed within the tree data table in metres

6.0 Stem Diameter (Stem DBH)

- Stem diameter measured at 1.5m above ground level for single stemmed trees (or immediately above the root flare for multi-stemmed trees) and other vegetation and detailed within the tree data table in millimetres

7.0 Root Protection Area (RPA)

- The root protection areas are calculated in accordance with the equations contained within Table 2 – Calculating the RPA, at Section 5.2.2 of BS5837:2005
- The highest/top figure within the tree data table represents the overall recommended root protection area in metres squared
- The second highest/middle figure within the tree data table represents the radius of a circle centred on the main stem of the tree in question in linear metres (which contains the required root protection area in metres squared)
- The lowest figure within the tree data table applies to ‘open grown’ trees only (Section 5.2.4 a of BS5837:2005) and represents a 20% reduction (in linear metres) in the size of the radius of the root protection area. Note this reduction can only be applied to one side of the tree(s) in question

8.0 Physiological Condition

- G = Good, F = Fair, P = Poor, D = Dead

9.0 Age Class

- Y = Young
- MA = Middle Aged
- M = Mature
- OM = Over Mature
- V = Veteran

10.0 Structural Condition & Comments

- Notes regarding structural condition (e.g. physical defects) and, if applicable, overall condition

11.0 Preliminary Management Recommendations

- Preliminary management recommendations including tree works, tree protection requirements, obvious ecological factors, further investigations of suspected defects etc.

12.0 Estimated Years

- Estimated remaining contribution to the local/wider landscape in years

13.0 BS5837:2005 Tree Quality Assessment (Cat Grade)

- Category A = trees of high quality and value and in such a condition as to be able to make a substantial contribution to the local and/or wider landscape for the next 40 years or more
- Category B = trees of moderate quality and value and in such a condition to make a significant contribution to the local and/or wider landscape for the next 20 years or more
- Category C = trees of relatively low quality and value and in such a condition to make provide an adequate contribution to the local and/or wider landscape for the next 10 years or more or young / self-seeded trees with a stem diameter below 150mm
- Category R = trees in such a poor condition that any existing landscape value would be lost within 10 years and/or trees that need to be removed for reasons of sound arboricultural management and/or health & safety

APPENDIX 2

Drawing Number DPA-69635-01

RESIDENTIAL

RESIDENTIAL

T5

T4

T3

Replacement 'No Dig' Permeable Surface & Landscape Planting

Basement Area

CAMDEN ROAD

TWYMAN HOUSE

Existing foundations / deep retaining walls left in situ to safeguard T1

Existing hard surface on frontage left in situ during demolition works. To be replaced with a 'No Dig' permeable surface & soft landscape planting

T1

T2

New staircase / access to canal from Camden Road agreed with British Waterways (including removal/replacement of T2)

Canal Footpath

REGENTS CANAL

KEY

= ROOT PROTECTION AREA (BS5837:2005) SHOWN AS A CIRCLE

= ROOT PROTECTION AREA (BS5837:2005) AMENDED TO REFLECT SITE CONDITIONS / EXISTING DEEP RETAINING WALL STRUCTURES

= TREE PROTECTIVE FENCING (BS5837:2005)

REV	DESCRIPTION	DRAWN BY	DATE

Issued for

PLANNING

SITE ADDRESS

TWYMAN HOUSE
CAMDEN ROAD
LONDON

CLIENT

CIT DEVELOPMENTS LTD

SCALE	SHEET SIZE	DRAWN	DATE
1:250	A3	DP	05.04.2011

DRAWING TITLE

PROPOSED LAYOUT
(TREE CONSTRAINTS)

DRAWING NUMBER	REVISION
DPA-69635-01	A

dpa
arboricultural consultants
The Boathouse
Ferry Road
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T: 020 8973 0067
www.dpa-uk.com
mail@dpa-uk.com
Company Reg. No. 7239976

APPENDIX 3

CellWeb Tree Root Protection System Details & Installation Check List

CI/SfB

Common Arrangement R12

Uniclass
L81208/L81210

CellWeb™

Tree Root Protection System

Geosynthetics

CellWeb™

Tree Root Protection System

The CellWeb™ TRP cellular confinement system protects tree roots from the damaging effects of compaction and desiccation, while creating a stable, load-bearing surface for vehicular traffic.

Potential loss of existing tree due to poor construction techniques.

CellWeb™ offers an alternative to the traditional methods of constructing roadways and building foundations that involve excavation, which can result in tree root severance and soil compaction from the passage of vehicles. Such damage can severely influence tree health, and in extreme cases leads to death. CellWeb™ can be sensitively installed close to and under the canopies of trees without negative effects.

Trees are valuable landscape features and a vital environmental resource. Increasingly, contractors are being required to ensure the health and survival of trees during and beyond the construction period. Although this is enshrined in BS 5837: Trees in Relation to Construction: Recommendations (2005) and Tree Preservation Order legislation, it presents several issues when implementing construction projects near to trees:

- Root severance caused by excavation, leaving trees open to decay, less stable and with a diminished capacity to utilise soil water and nutrients.
- Destruction of soil structure and compaction due to the passage of heavy vehicles, restricting the flow of water and air to tree roots.
- Need for construction access, new roadways and hard surfaces that require engineering-standard load-bearing foundations that meet building regulations.
- Need for high-performance, cost-effective driveways and roadways in the vicinity of tree roots.

The CellWeb™ system overcomes these issues and helps contractors to comply with tree health guidelines by creating a load-bearing base that is water-permeable, stable and durable.

With no need for excavation, the system is quick and easy to install, reducing construction time and saving costs and making it suitable for temporary and permanent solutions.

Glynebourne Wood.

Pedestrian path to recreational woodland built using a CellWeb™ foundation which was covered with DuoBlock and then filled with woodchip to create a porous surface.

Product features

CellWeb™ comprises an expandable cellular mattress that is then filled with a clean stone sub-base and above a Treetex T300 Geotextile.

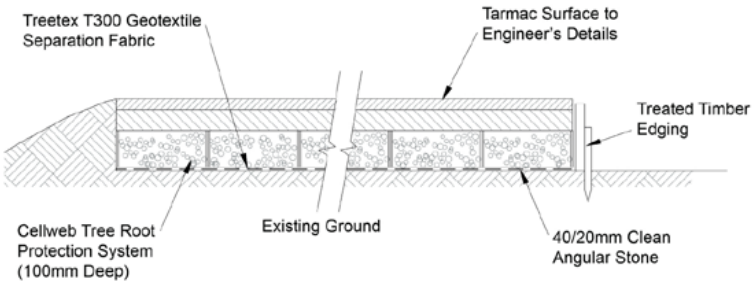
The honeycomb-like structure is made of robust high-density polyethylene (HDPE) that is simply stretched out and filled with clean angular material. Just like traditional roadways, the strength of the structure comes from the binding together of the infill, but with CellWeb™ this is achieved without compaction and without reduction in permeability.

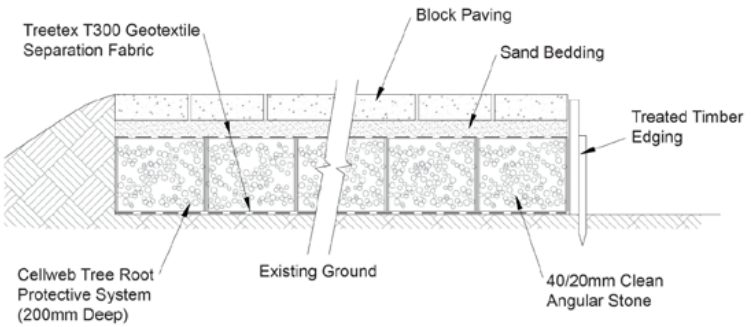
Perforated cell walls allow the angular infill to bind with the contents of the adjacent cell, but with sufficient space for the movement of water and air to nearby tree roots. As the infill contains no fines and the geotextile layers prevent clogging from particles washing into the system, the structure remains permeable to water over time and protects the roots for the lifetime of the tree.

As well as being quick and easy to install, CellWeb™ also dramatically cuts down the depth of sub-base required, in most cases by as much as 50%, further reducing costs. CellWeb™ significantly reduces surface rutting, increasing the long-term performance of the finished surface and ensuring that tree roots remain protected from vertical loads.

CellWeb can be used as a permanent solution or alternatively the system can be used in a temporary situation. In a temporary application the system can be used for the required period of time, then removed for use on another site or recycled, thereby adding to CellWeb's green credentials.

- No excavation – Soil structure remains undisturbed; risk of root damage minimised.
- Porous infill – Allows tree roots to conduct moisture and gas exchange.
- No compaction – No need to compact the infill to achieve a load-bearing structure.
- Lateral stability – Structure remains rigid to vertical loads.





Please call 01455 617 139
or email sales@geosyn.co.uk for further information.

Wide product range

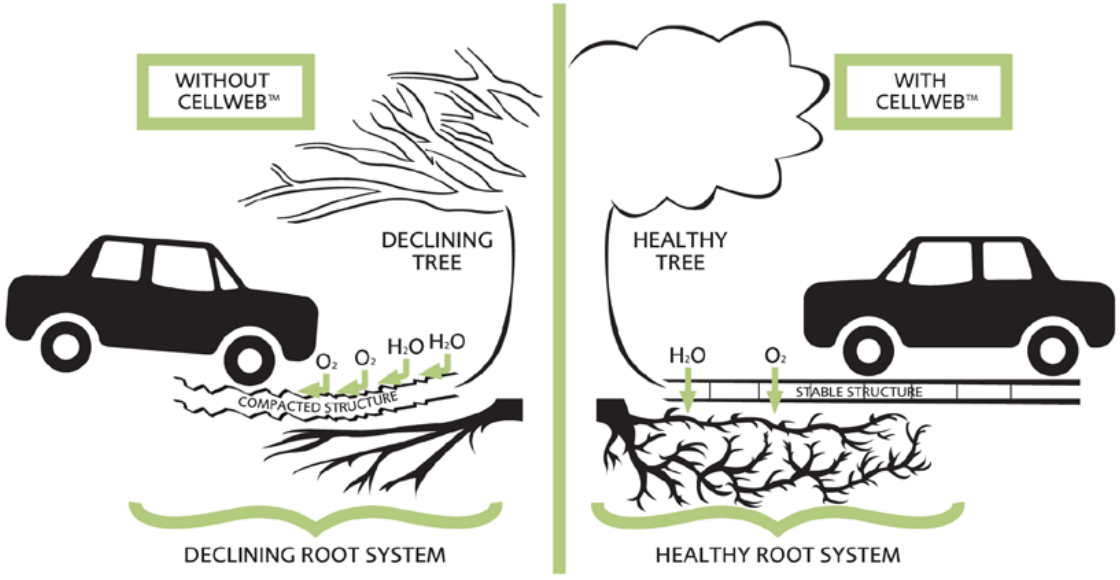
Large stock holding

Next day delivery

Hydrological benefits

Water is a shrinking resource in the urban environment. As the extent of the built environment increases, more and more ground is being covered by impermeable hard surfaces that repel rainwater runoff, preventing it from reaching the roots of vegetation, and in particular trees. Rapid water runoff stretches the capacity of stormwater drains and frequently results in drainage management issues that are rarely resolved in favour of adjacent trees.

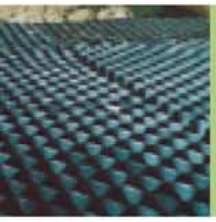
Using CellWeb™ mitigates these issues by promoting both the vertical and the lateral movement of water, whether the system is installed above or below ground. The 'pores' that are created by the spaces between the infill stones and the cell perforations even allow water to flow to adjacent tree roots that are effectively 'trapped' under areas of impermeable hard standing. CellWeb™ therefore helps to promote root growth and allows roots to continue to grow within areas of hard surfacing.



Design service

Onsite support

Geosynthetics



Design & installation

Final surfacing

The benefits of the CellWeb™ system to trees can only be maintained if a suitably porous final surface is selected. An ideal surfacing is the DuoBlocks grass reinforcement and gravel retention system, a visually attractive surface that has the advantage of being fully porous. Alternatives include block paviors, porous asphalts and loose or bonded gravel.

Call the Geosynthetics sales team on 01455 617 139 for more advice on surfacing options and other products and systems.

Advice and product selection

Geosynthetics Limited has been supplying the CellWeb™ system for many years and has acquired solid experience in its application. No two contracts are the same, and we understand the factors that need to be taken into account to specify the right CellWeb™ product.

We provide a FREE consultation, design and advisory service to find the solution that is most cost-effective and beneficial for your site. Our service includes product selection, CAD drawings and full instructions to help you from project conception to completion.

Call our sales office on 01455 617 139 for specification details and project-specific design assistance.

CellWeb™ in action:
Access road for the Lake District National Parks Authority.

Site before construction pictured above.

Installation of the CellWeb™ system.

Four years later.

Technical specification

Product Specifications

Properties	Standard Cell
Material	Virgin HDPE
Wall thickness	1.25mm
Seam welding	Ultrasonic to 100% of seam length
Cell depth	75, 100, 150, 200 and 300mm
Width of expanded panel	2.56m
Length of expanded panel	8.1m
Cell diameter (expanded)	259 x 224mm

Certified Quality

CellWeb™ is manufactured in accordance with the ISO 9001 Quality Management System in a comprehensive range of cell diameters and depths.

Geosynthetics Ltd

Geosynthetics

Geosynthetics Limited

Fleming Road, Harrowbrook Industrial Estate
Hinckley, Leicestershire LE10 3DU.

Tel: 01455 617 139

Fax: 01455 617 140
Email: sales@geosyn.co.uk

CellWeb TRP (Installation Checklist)

Installation of the CellWeb™ Cellular Confinement System within the Root Protection Area of Trees

The following installation checklist can be used on projects where CellWeb™ is being installed as a permanent hard surface, a sub-base, or as temporary root protection during construction works.

The installation procedure can be utilised by the Local Authority (LA) tree officer to ensure that CellWeb™, that is being used for tree root protection, will be effectively installed. Alternatively, it may be more appropriate to request that the installation is certified by arboricultural consultants who are experienced in the installation of CellWeb™ and who can offer installation certification as part of a package endorsed by Geosynthetics.

The completion of the CellWeb™ installation in accordance with this procedure will enable planning conditions to be successfully signed off on completion of the project.

Stage 1 Initial site meeting to assess tree protection requirements in line with the Arboricultural Method Statement (AMS) produced by the developer's arboricultural consultant.

- Check the ground conditions, including the presence of compaction or made ground.

  Is any remedial work required, such as the removal of old hard surfaces and rubble or soil decompaction?

- Compare the existing ground levels with the new levels proposed in the development.

  Do the new levels allow for the depth of hard surfaces installed with a CellWeb™ foundation without excavation?

  Will excavation be required to achieve the proposed levels or to enable site drainage or integration with other water management solutions?

- Assess the suitability of tree protection proposals, including the fencing and ground protection that will be used throughout the demolition and construction phases of development.

  Can CellWeb™ be used as ground protection throughout the development period and also form the foundation for final hard surfaces?

  Is a temporary CellWeb™ installation needed to enable site access for construction traffic over an area designated as requiring tree root protection?

- Consider how utility service installations can be integrated with the installation of CellWeb™.

  Can services be installed before the CellWeb™ is laid, or is it possible to use directional drilling later on in the development?

- Consider how other water management solutions for the site can be integrated with CellWeb™, including porous hard surfaces, drainage and underground storage.

  Has a combined and integrated water management plan been designed that considers retained trees?

  Do the water management solutions for the site consider the water requirements of retained trees?

  Do the storage solutions allow for the slow release of water into areas of the site accessible by tree roots, while also dealing with potential soil pollutants from surface water run-off?

- How are the developers going to ensure that the CellWeb™ is specified and installed effectively?

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Stage 2 Approval of the CellWeb™ site-specific installation method statement, which should include:

- Details of the sensitive removal of existing hard surfacing.
- Details of any remedial de-compaction work required.
- Root investigation procedures where site level changes require limited excavation to allow the installation of CellWeb™.
- A scaled site plan illustrating where the CellWeb™ will be installed that includes both existing and proposed levels.
- Details of how the CellWeb™ tree root protection system will be integrated with other traditional hard surface foundations on site.
- An integrated water management site plan illustrating working porous surfaces, drainage and water storage solutions, with consideration of the physical presence of roots and tree water requirements.
- Details of the CellWeb™ load limit specifications, with site-specific information.
- Engineering drawings provided by Geosynthetics showing the CellWeb™ specification.
- An engineering design indemnity policy based on a site-specific soil assessment.

Stage 3 Site visit before CellWeb™ installation to check that the ground has been prepared in accordance with the AMS. Check:

- Site level layout.
- The need for root investigations where excavation work is required to meet level requirements.
- Soil bulk density (compaction) CBR has been maintained.
- Completion of any site remedial work required before the installation of CellWeb™.

Stage 4 Site visit to check that materials supplied for installation comply with the installation method statement and AMS specifications. Check:

- The specification of the geotextile underlay.
- The specification of the cellular confinement system (depth and product used).
- The specification of the fill material (4/20, 20/20 or 20/40 washed angular stone with site-specific pH if required and appropriate structural load rating).

Stage 5 Site visit to check that the installation methodology meets the manufacturer's specification and is in accordance with the AMS. Check:

- The minimum cell size.
- The orientation of the sheet layout.
- There is sufficient fill to form a cell structure.
- The upper geotextile has been installed to maintain the CellWeb™ sandwich.

Stage 6 Site visit to check that the final surface installation meets the porosity specification in the installation method statement and the AMS.

Stage 7 Project sign off.

Following this checklist should ensure the successful specification and installation of CellWeb™ as a tree root protection system, either as a temporary ground covering during development or as a structural sub-base for permanent porous hard surfaces.

This checklist has been written to enable Local Authority Tree Officers to plan site visits and document checks in a structured way. However, the same procedure can be completed by an independent arboricultural consultant as part of a certification program offered by Geosynthetics Ltd using dedicated arboricultural consultants and approved installers.

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